REMARKS

The present invention is a method for defining the relationship between frequency and amplitude of a pulse function for acting on a data stream for transmission in a telecommunication system in accordance with a predetermined modulation scheme, a dual mode communication device operable in a first mode in a TDMA telecommunication system in which a channel is a combination of frequency and timeslot and a second mode in a CDMA telecommunications system, and a dual mode communication device operable in a first mode when a first set of cost parameters are desired and in a second mode when a second set of cost parameters are desired.

In accordance with the present invention no predetermined mathematical relationship is required for a pulse shaper used with the transmission of a data stream. The shape of the pulse is defined in order to meet desired cost parameters with cost functions being functions which are positive and become smaller with better system performance. See page 5, lines 27-28 through page 7, lines 1-12.

Claims 25-30 stand rejected under 35 U.S.C. §112, second paragraph, as being indefinite. Claims 25-30 have been cancelled to moot the stated grounds of rejection.

Claims 1-8 and 10-12 stand rejected under 35 U.S.C. §103 as being unpatentable over United States Patent 5,790,516 (Gudmundson et al) in view of United States Patent 5,953,377 (Yoshida). This ground of rejection is traversed for the following reasons.

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With respect to claim 1, the Examiner reasons as follows:

> Regarding claim 1 Gudmundson teaches a method for defining a relationship between frequency and amplitude of a pulse function for acting on a data stream for transmission in a telecommunications system in accordance with a predetermined modulation scheme (see col. 4, lines 63-67, col. 5, lines 1-50 and col, 9, lines 15-20 & 45-55). Gudmundson teaches defining the amplitude of a pulse function over a range of frequencies (see col. 5). Gudmundson does not specifically teach defining a desired cost parameter or a range of frequencies in dependence with a desired cost parameter. Yoshida teaches defining a desired BER performance parameter and a range of frequencies in dependence with a desired BER performance parameter (see col. 2, lines 25-26 & 36-40, col. 3, lines 42-49, col. 4, lines 18-25), the BER performance parameter is a system parameter that is positive and gets smaller the better a system operates which relates to applicant's claimed definition of a cost parameter. It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the device adapt to include defining a desired cost parameter or a range of frequencies in dependence with a desired cost parameter because this would allow for improved data transmission over a radio path using multiple modulation techniques.

The Examiner's reasoning is erroneous for the following reasons.

Claim 1 recites a method for defining the relationship between frequency and amplitude of a pulse function for acting on a data stream for transmission in a telecommunications system in accordance with a predetermined modulation scheme, the method comprising: defining desired cost parameters; and defining the amplitude of the pulse function over a range of frequencies and dependence on the desired parameters. The proposed combination of Gudmundson et al and Yoshida is deficient in teaching defining of the amplitude of the pulse function over a range of frequencies in dependence on the desired cost parameters. Gudmundson et al teaches in column 4, lines 23-26, that the pulse shaping function may be a raised cosine pulse over the period P which pertains to a single parameter. While Fig. 3A

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illustrates a pulse with amplitude, as alluded to by the Examiner, there is no disclosure of any relationship between the amplitude of the pulse shaping and defining the amplitude of the pulse function over a range of frequencies in dependence on the desired cost parameters.

Yoshida does not cure the deficiencies of Gudmundson et al. Yoshida discloses a transmitter and receiver which can maintain a high BER and a high frequency utilization efficiency particularly under fading environments. See column 3, lines 42-48. However, there is nothing in Yoshida which teaches the claimed defining the amplitude of the pulse function over a range of frequencies in dependence on the desired parameters. Accordingly, if the proposed combination was made, the subject matter of claim 1 would not be achieved except by impermissible hindsight.

Moreover, Gundmundson is relevant to the frequency domain and Yoshida is relevant to the time domain. Therefore, it is submitted that a person of ordinary skill in the art would not be led to combine their teachings to obtain the subject matter of claim 1 except by impermissible hindsight.

Claim 2 further limits claim 1 in reciting the amplitude of the pulse function over a range of frequencies is defined in an iterative process in which the pulse function is altered and the cost parameters are determined until an acceptable balance of cost parameters is achieved. The Examiner alludes to column 5 of Gudmundson for teaching this subject matter. However, as has been discussed above, while Fig. 3A shows an amplitude of a pulse function, the aforementioned defining the amplitude of the pulse function over a range of frequencies in

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dependence on the desired cost parameters is not disclosed. Accordingly, the subject matter of claim 2 is also not present.

Claim 3 further limits claim 1 in reciting that the method comprises the step of weighting the respective cost parameters. The Examiner cites column 4, lines 18-22. However, it is not understood how the referenced portion of Yoshida reads upon the "weighting the respective cost parameters" in combination with the "defining the amplitude of the pulse function over a range of frequencies in dependence on the desired cost parameters" as recited in claim 1. If the Examiner persists in his reliance upon column 4, lines 18-22, as teaching the subject matter of claim 3, it is requested that he be more specific on the record to point out his basis for such a conclusion.

Claim 4 further limits claim 3 in reciting that an acceptable balance between the cost parameters is achieved by optimizing the respective costs with the respective "weightings". It is submitted that the referenced portions of Yoshida, column 3, lines 42-49, and column 4, lines 20-23, do not teach this subject matter.

Claim 5 further limits claim 4 in reciting that the optimization is performed using an optimizer computer program. Claim 5 is patentable for the same reasons set forth above with respect to claim 4.

Claim 6 further limits claim 1 in reciting that the cost parameters are selected from one or more of the group including power efficiency, spectral efficiency, error rate, AFC, Nyquist, and energy. While Yoshida does disclose bit error rate, there is no disclosure of selecting of a group as recited in claim 6 and moreover, Yoshida does not disclose the defining the amplitude of the pulse function over a range of

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frequencies in dependence on the desired cost parameters as discussed above with respect to the rejection of claim 1.

Claim 7 further limits claim 1 in reciting a pulse function generator for converting a data stream in accordance with a pulse function shape in accordance with the relationship defined by the method of claim 1. Claim 7 is patentable for the same reasons set forth above with respect to claim 1.

Claim 8 recites a modulator for providing a signal for transmission in a telecommunication system comprising means for shaping a data stream in accordance with the pulse function generator of claim 7. Claim 8 is patentable for the same reasons set forth above with respect to claim 7.

Claim 10 recites a modulator according to claim 8 wherein the means for shaping comprises a look up table. Claim 10 is patentable for the same reasons set forth above with respect to claim 8.

Claim 11 recites a transceiver for a communication device comprising a modulator in accordance with claim 8 and a demodulator. Gudmundson's teaching of a modulator and a demodulator does not render obvious the aforementioned subject matter.

Claim 12 further limits claim 11 in reciting a communication device operable in a communication system comprising a transceiver in accordance with claim 11. Claim 12 is patentable for the same reasons set forth above with respect to claim 11,

Claim 9 stand rejected under 35 U.S.C. §103 as being unpatentable over Gudmundson in view of Yoshida and Black et al. Black et al have been cited as

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teaching a compensation filter. However, Black et al do not render the deficiencies noted above with respect to the rejection of claims 1, 7 and 8.

Claims 13-14 and 17-22 stand rejected under 35 U.S.C. §103 as being unpatentable over Gudmundson et al in view of Yoshida and United States Patent 6,567,389 (Honkasalo et al). This ground of rejection is traversed for the following reasons.

Claim 13 further limits claim 7 in reciting a modulator for providing a signal for transmission in a TDMA telecommunication system in which a channel is a combination of frequency and timeslot in accordance with a predetermined modulation scheme wherein the data stream is shaped in accordance with the pulse generator of claim 7 prior to modulation with a carrier signal. Honkasalo et al has been cited as teaching providing a signal for transmission in a TDMA telecommunication system. Honkasalo et al's disclosure of a TDMA system does not cure the deficiencies noted above with respect to the rejection of claims 1 and 7.

Claim 14 recites a modulator for providing a signal for transmission in a CDMA telecommunication system in accordance with a predetermined modulation scheme, wherein the data signal is shaped in accordance with a pulse generator of claim 7 prior to modulation with the carrier signal. The Examiner relies upon column 4, lines 25-34. Honkasalo et al teach that their invention is applicable to both TDMA or CDMA multiple access systems. Honkasalo et al teach splitting a high speed data signal into two or more signals of lower speed prior to transmission over a radio path from a transmitting end to a receiving end which is applicable to the aforementioned multiple access techniques. This teaching would not motivate a

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person of ordinary skill in the art to achieve the subject matter of claim 14 as suggested by the Examiner except by impermissible hindsight.

Claim 17 recites a dual mode communication device operable in a first mode in a TDMA telecommunication system in which a channel is a combination of frequency and timeslot and a second mode in a CDMA telecommunication system, comprising a modulator for modulating a data stream with a carrier signal in accordance with a predetermined modulation scheme in both the first and second modes of operation and a pulse function generator for shaping a data stream in accordance with pulse functions shaped in accordance with the predetermined modulation scheme. As noted above, Honkasalo et al teach a method of splitting a high speed data signal into two or more signals of lower speed which is applicable to different multiple access modulation techniques including TDMA or CDMA. This disclosure does not suggest a dual mode communication device. Moreover, the proposed combination does not teach a modulator of a data stream with a carrier signal in accordance with a predetermined modulation scheme in both first and second modes of operation and a pulse function generator for shaping data in accordance with pulse function shaped in accordance with the predetermined modulation scheme of operation for dual mode communication devices recited in claim 17. The subject matter of claim 17 is not obvious in view of the above noted deficiencies.

Claim 18 recites a dual mode communication device operable in a first mode when a first set of cost parameters are desired and in a second mode when a second set of cost parameters are desired, the communication device comprising: a first function generator for shaping a data stream in accordance with a pulse function

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shaped in accordance with the predetermined modulation scheme; a second pulse function generator for shaping a data stream in accordance with a pulse function shaped in accordance with the predetermined modulation scheme; and means for selecting the pulse function generator in accordance with the mode of operation of the dual mode communication device; and wherein at least one of the pulse functions is shaped in accordance with the relationship defined by the method of claim 1. The deficiencies of Gudmundson et al and Yoshida have been discussed above with respect to claim 1. Moreover, Honkasalo et al's deficiencies have been discussed above. The subject matter of claim 18 is not obvious in view of the above noted deficiencies.

Dependent claims 19-22 further limit claim 18 in a manner which his not rendered obvious by the proposed combination.

Claim 23 recites a dual mode communication device operable in a first mode when a first set of cost parameters are desired and in a second mode when a second set of cost parameters are desired, the communication device comprising: a modulator for modulating a data stream with a carrier signal in accordance with a predetermined modulation scheme in both the first and second modes of operation; a first pulse function generator for shaping a data stream in accordance with a pulse function shaped in accordance with the predetermined modulation scheme; a second pulse function generator for shaping a data stream in accordance with a pulse function shape in accordance with the predetermined modulation scheme; and means for selecting the pulse function generator in accordance with the mode of operation of the dual mode communication device. As stated above with respect to claims 17 and 18, the proposed combination does not suggest a dual mode

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communication device, including the combination of a modulator, a first pulse function generator, a second pulse generator and means for selecting the pulse function generator in accordance with the mode of operation of the dual mode communication devices recited in claim 23.

Claim 24 defines a method for selecting a modulation scheme for a communication system, the method comprising: defining a pulse function for a first modulation scheme of the predetermined modulation scheme in accordance with the method as claimed in claim 1; defining a pulse function for a second modulation scheme for the predetermined modulation scheme for the same desired cost parameters; determining the resultant cost parameters for each scheme; and selecting the modulation scheme which gives good resultant cost parameters given the desired ones. Claim 24 is patentable for the same reasons set forth above with respect to claim 1.

Newly submitted claim 31 is patentable for the same reasons set forth above with respect to claim 1.

Newly submitted claim 32 is patentable for the same reasons set forth above with respect to claim 7.

Newly submitted claim 33 is patentable for the same reasons set forth above with respect to claim 8.

Newly submitted claims 34-37 are respectively patentable for the same reasons set forth above with respect to claims 11-14.

Newly submitted claims 38 and 39 are patentable for the same reasons set forth above with respect to claims 18 and 23.

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Newly submitted claim 40 is patentable for the same reasons set forth above with respect to claim 24.

It should be noted that newly submitted claims 31-40 are substantively claims which were allowed in the United Kingdom.

In view of the foregoing amendments and remarks, it is submitted that each of the claims in the application is in condition for allowance. Accordingly, early allowance thereof is respectfully requested.

To the extent necessary, Applicants petition for an extension of time under 37 C.F.R. §1.136. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account No. 01-2135 (367.38797X00) and please credit any excess fees to such Deposit Account.

Respectfully submitted,

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